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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/15/2006

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EXAMINER

NGUYEN, TAM M

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/682,593

Applicant(s)

HAN ET AL.

Examiner

Tam M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-11 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) 18-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-11, 13-17 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) ☐ Notice of Informal Patent Application |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) ☐ Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 13-17 and 21 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling a catalyst bed voidages of .35-.45 is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Response to Amendment

The rejection of claims 6-9 and 13-16 under 35 USC § 112 is withdrawn by the examiner in view of the amendment filed on August 24, 2006.

The rejection of claim 1 under 35 USC § 102(b) anticipated by admitted prior art is withdrawn by the examiner in view of the amendment filed on August 24, 2006.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gao et al. (6,117,812) in view of Imai et al. (5,043,509)

Gao discloses a counter-current catalytic distillation column. The column is randomly packed with a catalyst having a spherical shape. The catalyst comprises a metal of Group VIB and/or a metal of Group VIII (e.g., Pd) wherein the amount of Pd in the catalyst ranges from 0.01 to 1 wt. %. (See col. 4, lines 51-58; col. 5, lines 46-51; col. 6, lines 21-44, 62-68; col. 7, lines 1-12).

Gao does not specifically disclose the difference of voidages between the adjacent catalyst layers as claimed, does not teaches that the column comprises a low-voidages layer and a

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high voidages layer and the volume percentage of each layer in the reactor, and does not specifically disclose the operating conditions of the column.

Imai discloses a conversion process wherein the voidages of the catalyst ranges of from 0.046 to 0.518. (See abstract; col. 1, line 66 through col. 2, line 2; col. 3, lines 32-38; col. 6, lines 55-59; Tables 3 and 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Gao by utilizing the voidages as suggested by Imai because such voidages would prevent an excessive pressure drop in the reactor and allow an uninterrupted flow of feedstock.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Gao by utilizing the two catalytic sections as claimed because Imai teaches the catalyst layers can be various from 0.046 to 0.518. Therefore, one of skill in the art would use any catalyst section which has different voidages including the claimed catalyst sections.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Gao by operating the process at the claimed conditions because it has been held by the patent law that the selection of reaction parameters such as temperature would have been obvious. More particularly, where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller 105 USPQ 233, 255 (CCPA 1955). In re Waite 77 USPQ 586 (CCPA 1984). In re Scherl 70 USPQ 204 (CCPA 1946). In re Irmischer

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66 USPQ 314 (ccpa 1945). In re Norman 66 USPQ 308 (CCPA 1945). In re Swenson 56 USPQ 372 (CCPA 1943). In re Sola 25 USPQ 433 (CCPA). In re Dreyfus 24 USPQ 52 (CCPA 1934).

Claims 1-4, 6-11, 13-17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrison et al. (5,252,198) in view of Imai et al. (5,043,509).

Harrison discloses a hydrotreating process by passing a liquid hydrocarbon feed (e.g., distillate) into a counter-current reactor in the presence of hydrogen. The reactor is operated at a temperature of from 240-400° C, at a pressure of from 20 to 150 bars (2-15 MPa), and at a stoichiometric hydrogen amount. The catalyst used in the process comprises a metal of Group VIB (e.g., Mo) and a metal of Group VIII (e.g., Ni). (See abstract; col. 3, line 57 through col. 4, line 38; col. 8, lines 55-68; col. 9, line 20-41; col. 11, lines 64-68)

Harrison does not disclose the difference of voidages between the adjacent catalyst layers as claimed, does not disclose that the catalyst comprises noble catalyst such as Pt, does not disclose the volume percentage of each layer in the catalyst bed, and does not disclose that the LHSV is of from 0.1 to 7.5 h⁻¹

Imai discloses a conversion process wherein the voidages of the catalyst ranges of from 0.046 to 0.518. (See abstract; col. 1, line 66 through col. 2, line 2; col. 3, lines 32-38; col. 6, lines 55-59; Tables 3 and 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Harrison by utilizing the voidages as suggested by Imai because such voidages would prevent an excessive pressure drop in the reactor and allow an uninterrupted flow of feedstock.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Harrison by utilizing the two catalytic sections as claimed because one of skill in the art would utilize any percentage ratio of each catalyst layer having different voidages with the expectation that any voidage and percentage ratio would give similar results.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Harrison by utilizing the claimed LHSV because it has been held by the patent law that the selection of reaction parameters such as temperature would have been obvious. More particularly, where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller 105 USPQ 233, 255 (CCPA 1955). In re Waite 77 USPQ 586 (CCPA 1984). In re Scherl 70 USPQ 204 (CCPA 1946). In re Irmischer 66 USPQ 314 (ccpa 1945). In re Norman 66 USPQ 308 (CCPA 1945). In re Swenson 56 USPQ 372 (CCPA 1943). In re Sola 25 USPQ 433 (CCPA). In re Dreyfus 24 USPQ 52 (CCPA 1934).

Response to Arguments

The argument that nowhere does Imai discuss gas-liquid countercurrent process in a fixed bed reactor and does not teach at least two catalyst layers with different voidages is not persuasive. Gao already teaches a countercurrent process and catalyst beds. The examiner relied upon Imai to teach that it is known to utilize catalyst beds with different voidages to prevent an excessive pressure drop in the reactor and allow an uninterrupted flow of feedstock.

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The argument that Imai does discuss any problem associated with gas-liquid countercurrent process is not persuasive. The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

The argument that since the process of Imai and the process of Gao or Harrison are two different types of processes, it is not obvious to combine the two processes is not persuasive. Since Imai teaches that it is advantage to maintain a sufficient voidages in a catalyst bed, one of skill in the art would apply the teaching in any process which is involved with a catalyst bed including in a countercurrent process.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam M. Nguyen whose telephone number is (571) 272-1452.

The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tam M. Nguyen
Examiner
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TN